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# THE GALLOP.

BY

EDWARD L. ANDERSON

AUTHOR OF "HOW TO RIDE AND SCHOOL A HORSE,"
"A SYSTEM OF [illegible] FOR HORSES."

*ILLUSTRATED BY INSTANTANEOUS PHOTOGRAPHS*

BY JOHN ANNAN.

EDINBURGH
DAVID DOUGLAS, 15 CASTLE STREET
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# THE GALLOP.

In a state of nature the horse moves at the Walk, the Trot, the Gallop, or the Run.[1]

## THE WALK.

In the walk, a flat and tame pace which bears about the same relation to the trot that the gallop holds to the run, the horse may lead off with any foot, usually with the fore-leg, which is diagonally opposite to the hind-leg furthest behind the centre of gravity. The leg which is diagonally disposed to the one which initiates the movement is then advanced, then the other leg of the extremity with which the walk originated is moved up, and then the fourth leg is put forward.

If the horse should begin the walk with the left fore-leg leading, it would be followed by the right hind-leg: then the right fore-leg would be moved forward, and as the mass advanced the left hind-leg would be detached

[1] Some short coupled horses, usually those with drooping rumps and outward-turned thighs, have a pace in which the hind-leg moves simultaneously with the fore-leg of the same side: and I have seen horses of this description proceed no faster than a walk in the same manner.

and carried up. The legs would follow the same order during the movement.

If the horse be perfectly collected he will begin the walk with the fore-leg opposite to the side from which the stimulation to movement comes. That is, if the right spur be applied, the horse would begin the walk with the left fore-foot.

In the walk the horse has never less than two feet planted at the same time, one of the fore-hand and one of the croup. In certain stages he has three feet upon the ground at once, two of either extremity, and one of the other. But the four feet are never bearing the weight together.

The walk is a pace of four flat beats, and when it is perfectly performed, the rhythm should be even and true.

## THE TROT.

But when the action becomes quick and energetic, and the horse leaves the ground in a succession of springy steps, and the foot-beats are sharp and clear, the pace is a trot. In this gait the legs are moved in the order of the walk, and, as the speed is increased, the legs diagonally disposed are brought into action almost simultaneously, a hind-leg following a fore-leg with a very short interval. In a perfectly-balanced trot, as is the

passage, the diagonal legs are raised almost together, and they reach the ground at nearly the same time, the horse having been in air.

Even at a low rate of speed, in a disunited trot, the horse is free from the ground at each stride, and he may at times have three feet bearing the weight; but as the speed is increased, the third foot is not permitted to remain. Where one foot is on the ground it may be of either extremity, and where two feet are planted they are a foot of either extremity, and the foot diagonally disposed.

In a rapid trot, the horse—as is proved by the photograph in Mr. Stanford's work, *The Horse in Motion*, plate xxxvi., figures 11, 12, 13, 20, 21, and 22—leaves the ground always from a hind-foot to receive the weight upon the diagonal fore-foot, and almost at the same time the other hind-foot, and at no time are more than two feet upon the ground together.

## THE RUN AND THE GALLOP.

If I am not the first to point out differences between the run and the gallop, I am, without doubt, the first[1] to

[1] *Stonehenge* declares that the canter is a distinct pace from the gallop, and confidently asserts (*Riding and Driving*, p. 36) that in the former, 'one foot is always in contact with the ground.' The photographs in Stanford's book show that this description of the canter is inexact; and, it may be said, the Continental writers do not recognise it as a pace.

show all the reasons why these should be held distinct paces. It is true that in the United States of America, the trials of speed between thoroughbred horses are denominated 'running races,' but this term is used to distinguish those sports from the trotting matches so common in that country.

In my review of *The Horse in Motion* (published in the *Illustrated Sporting and Dramatic News* of July 2d, 1882) I stated it as my belief that the gallop was so dissimilar, in essential points, to the fast pace of the race-horse, that they could not be identical.

In the article referred to, I endeavoured to prove my proposition by describing the differences, in vigour of action, in rhythm, and in sensation of motion, between the two paces, and I did not hesitate to say that I thought that artists would be misled with regard to the gallop, rather than properly guided, by Governor Stanford's volume.

My theory, in this country at least, met with adverse criticism, and I undertook the experiments upon which this little work is founded, to put the question beyond doubt. I now submit the case to the judgment of the public.

## THE RUN.

What the run is, in all its details, is now well known through Mr. Muybridge's excellent photographs (see

Plate I.). The horse leaves the ground from one of his fore-feet, receives the weight upon the diagonally disposed hind-foot (planted four feet or more in advance of the spot just left by its predecessor), divides the burden between this and the other hind-foot, takes the mass upon the last-mentioned, then divides the weight with the diagonally disposed fore-foot, takes the mass upon this fore-foot, to afterwards divide the weight between that and the first-used fore-foot, and from the last named leaves the ground, by aid of the momentum, in a new stride.

Each leg has in turn received the whole weight, and the burden has been borne by the two hind-legs, a hind-leg and a fore-leg, and the two fore-legs. The mass has been carried along as if over a series of crutches, the succession slightly broken at the beginning of each stride.

When the horse passes the weight from one fore-leg to the other (see figure 1, Plate I.), he is very much extended. After he leaves the ground the hind-legs are carried under the body to receive the weight under the centres of gravity and of motion, and the horse is in a very cramped position (see figure 8, Plate I.).

I marked down the footprints of the running horses as they were represented in Muybridge's photographs, and compared them with the tracks made by galloping horses

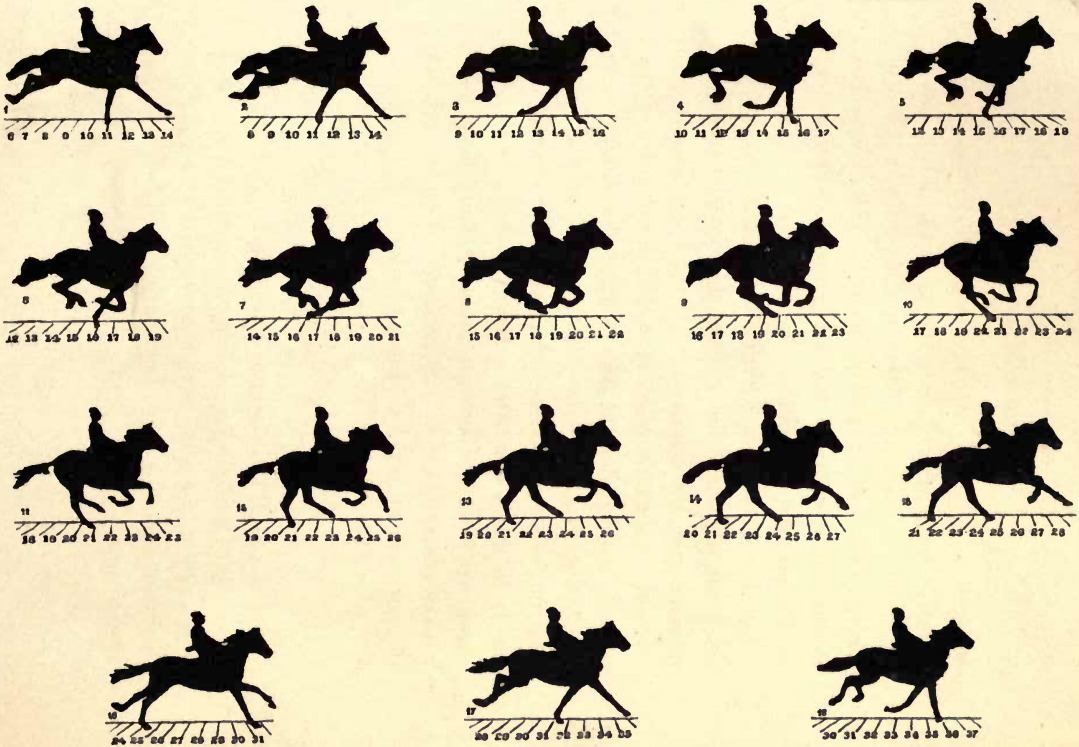
in the sand. I saw that there were differences in the strides of the paces. I rode horses in the gallop and in the run, and observed differences in the sensations of motions, and in the rhythm of foot-falls. All this assured me that Mr. Muybridge had not given representations of the horse in the true gallop.

I will endeavour to describe the true gallop, and to point out wherein it differs from the run and from that spurious pace, the canter.

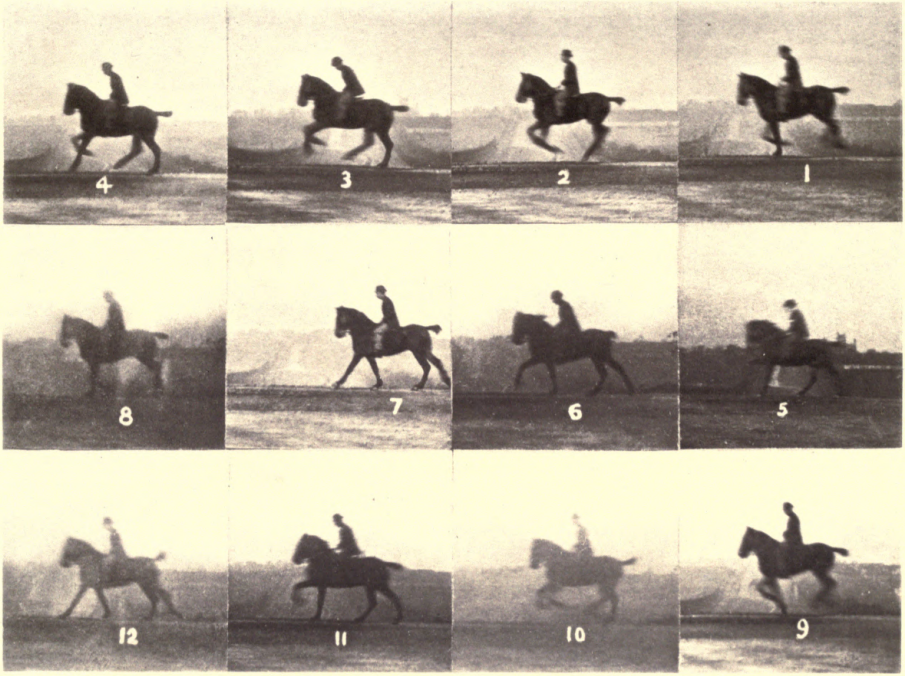
As in the walk the legs are moved in the order of the trot, so in the gallop the legs observe the same general order of the run; and the differences between the walk and the trot, and between the gallop and the run, are chiefly in the vigour and extent of action, and in the changes of intervals between the movements of the legs; but the effects are such that the horse does not present the same aspect in the contrasted paces.

## THE GALLOP.

I wish to call the attention of the reader to Plate III., in which the *galloping* horse is represented as it appeared in a series of instantaneous photographs taken under my direction, and which are here reproduced by the Autotype process.



FLORENCE—A RUNNING STRIDE, 20 FT. 6 IN. PLATE XVII. 'The Horse in Motion.'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In the gallop, the horse leaves the ground from one of his fore-legs—let us say the right fore-leg (figures 1 and 2). The mass is then received by the left hind-leg, planted on or near the spot just vacated by its predecessor (figure 3). The right hind-leg then reaches the ground at *exactly the same moment* that the left fore-leg is planted (figure 5 or 11).[1] The weight is borne, then, by three legs, and as the mass is advanced (figure 6), the left hind-leg is detached (figure 7), and the right fore-leg is put to the ground. Again three legs bear the weight. Then, owing to the want of sufficient momentum and the lack of propulsive force in the fore-hand, the mass is thrust over upon the right fore-leg by the impetus from the right hind-leg (figure 8), and from the right fore-leg the horse again goes into air in a new stride (figure 9).

The first nine figures show a completed stride. The remaining three figures in the Plate are superfluous, and

[1] In the figure (4, Plate III.), where the two diagonal legs are coming to the ground, it will be observed that the fore-leg is *extended*, and the hind-leg *being extended*, so that, considering the distances the feet have to travel to reach the ground, they should be planted at exactly the same moment. It should be observed that the light-coloured line, which appears in the original negatives of my pictures, and which has not been augmented or touched in these true copies, is the path upon which my horse passes: and in figure 4, Plate III., the fore-foot is still several inches from the ground. This is the pace described by Professor Marey as 'the gallop of three beats,' and the *camera* confirms the correctness of the theory he reached through his experiments in recording the foot-falls of the horse.

were retained because they show the horse in slightly different stages of the same action; but they were not strongly enough marked in points of distinction to be introduced among the nine others, by which the gallop was sufficiently explained.

The velocity might be great enough to have the mass transferred from the left fore-leg to the right fore-leg, without the intervention of the right hind-leg, and the pace still be the gallop, provided that the horse was so collected that he had planted the right hind-leg and the left fore-leg at the same time. But at the low speed in which I rode the horse in my experiment—not greater than six miles an hour—the momentum was not sufficient to give me an example of that position.

## THE RUN AND THE GALLOP CONTRASTED.

If we compare the horse in the corresponding attitudes of the two paces, as exhibited by the camera, we shall see how widely they vary, both in regard to the general appearance of the animal, and with reference to the actual motions.

In the disconnected state in which the horse performs the run, it would be impossible for him to have three feet upon the ground at any time, or at any rate of speed, but

this position is necessary in the gallop, because he is collected. In the measured and balanced gallop there is greater regularity of action, and the rhythm of foot-beats is more uniform than in the run; and the carriage of the horse is more graceful and elegant in the former pace. In fact, there is so little correspondence between the gaits in motion, action, and tenor, that it is a matter of surprise that they have ever been held to be identical.

## THE CANTER.

The canter is a spurious pace of the disunited horse, and is not performed by the animal in liberty or when properly ridden. It is not that the velocity is too low to permit the legs in their proper order to support the centre of gravity, but it is owing to the uncollected state he is in, and to the languor of his action, that he does not maintain the poise required for a regular pace. That want of momentum is not the cause of the feeble action of this pace is proved by the fact that the gallop can be performed by a well-suppled horse at a rate no faster than a walk. And the strides of the horses with which I made my experiments for obtaining the footprints in the sand were shorter than those of the cantering horse in Mr. Muybridge's photographs.

In the canter, the action is so low and weak that a fore-foot is planted *before* the second hind-foot reaches the ground (see Plate II.). The rising of the fore-hand as the horse takes the weight, from the leap, upon the hind-leg is hardly perceptible, and the fore-hand drops almost at that moment.[1] It has four irregular beats, and in the middle of each cadence there is a sensation to the rider of settling back. It is impossible to make the changes of lead in such a pace, nor could the rapid turns of the gallop be accomplished by a cantering horse.

The gallop is a pace of three beats, the pauses regularly observed, and the intervals between the beats even as are those between each cadence; the sensation of motion is always forward. At each stride, as the horse takes his weight upon the hind-leg, from the leap, the fore-hand rises, and the changes of lead or the quick turns may be readily effected. It is because the horse is *collected* that a hind-leg and a fore-leg come together to the ground. If the horse were disunited, the pace might be either a canter or a run.

[1] When the horse takes the weight upon the first hind-leg, in the gallop, the fore-hand is in air (figure 3, Plate III.). But it will be observed (figure 4, Plate II.) that in the canter the first fore-foot is within a few inches of its place on the ground at the instant the weight is received upon the first hind-foot, and that the second hind-foot is only up even with the first fore-foot, and has still to be moved twenty-four inches (fig. 6).

## THE RHYTHM OF THE THREE PACES.

If we let 1 represent the left hind-leg, 2 the right hind-leg, 3 the left fore-leg, and 4 the right fore-leg, and suppose the horse to be leading with his right side, we may express the rhythm and order of the three paces in the following manner :—

The run would be, 1.2. 3.4. 1.2. 3.4. 1.2. 3.4.

The canter would be, 1.3. 2. 4. 1.3. 2. 4.

The gallop would be, 1. $\frac{2}{3}$. 4. 1. $\frac{2}{3}$. 4. 1. $\frac{2}{3}$. 4.

But if, in the gallop, the leg represented by 3 came to the ground before that represented by 2, it would prove that the horse was disconnected, and the pace had degenerated into a canter; and if there should be a pause between foot-falls of the second and the third legs, then we should know that the horse was not collected, and that the gallop had become a run.

## WHEN THE GALLOP BECOMES THE RUN.

So long as the horse is united and in hand, so that the action is even and regular, and the rhythm of three beats is maintained, the pace is the gallop, even though the mass be not thrown upon the leading fore-foot from the hind-foot of the same side. But when the horse is so extended that he becomes disunited and out of hand (that is, unable to respond instantaneously to the demands

of the bit), or the cadence is broken by an interval between the foot-falls of the hind-feet and those of the fore-feet, or the motion is irregular, the horse is not in the gallop.

### THE DIAGRAM.

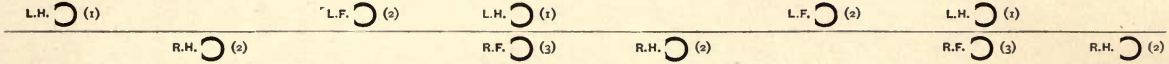
In support of what I have said, I offer the accompanying diagram, in which the foot-marks of the horse in the run and in the canter have been designed from the plates in Governor Stanford's book, and the prints of the hoofs in the gallop represent the results of experiments I made with horses ridden at that pace upon the hard sand of the seashore.

### THE PHOTOGRAPHS.

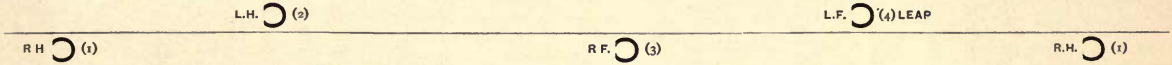
I also offer some photographs taken by Mr. John Annan of Edinburgh (see Plate III.). These true representations of the galloping horse have not been corrected or tampered with in any way, and are given exactly as they were taken upon the negatives, with all their imperfections.

From a consideration of the diagram, and from the comparison of my photographs with those of the running horse in Governor Stanford's work, the reader may readily determine whether the gallop and the run are identical paces.

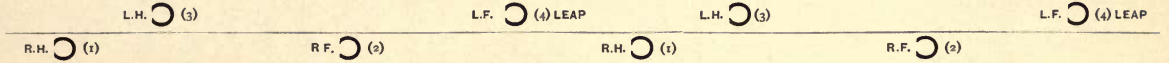
If the gallop be not a gait distinct from the run and




THE GALLOP—Leading with Right side. According to E. L. A.




RUNNING.—Designed from Plate XVII. The Horse in Motion.




THE CANTER.—Designed from Plate XXVII. The Horse in Motion.

Diagram of Footprints in The Gallop, The Run, and The Canter. Drawn to a scale of three feet to the inch. R stands for Right, L for left, F for fore-foot, H for hind-foot. The numbers in brackets show the order in which the feet reached the ground. In the Run and the Canter the horse is leading with the left side.

the canter, then the walk and the trot must be held one and the same thing, for it is more difficult to draw the lines between the walk and the trot, than between the gallop and the run or the canter. In neither of these cases is it a question of *speed* alone, but of *regularity* and *extent*, and *manner* of *action.*

In the gallop, the horse is collected between bit and spurs, and can make short turns in the beat of the gallop, and can come to an instantaneous halt, from a high rate of speed. But in the disconnected forms in which a horse runs, he cannot with safety turn except upon large circles, and he can only be brought to a halt by a succession of shortened strides.

Either at liberty or under the rider the horse may take the gallop from a rest, a walk, or a trot.

### HOW THE HORSE BEGINS THE GALLOP.

From a rest or a walk, the horse raises the fore-hand, and extending the fore-legs, one slightly in advance of the other, throws his weight upon them, and, with the impetus so given, leaves the ground in the gallop from the fore-leg furthest advanced. When pushed beyond his equilibrium in the trot he takes the gallop or the run by leaving the ground from one of his fore-feet, with the momentum of the speed.

## WHY THE RIDER MUST ASSIST THE HORSE IN THE GALLOP.

The horse will gallop at liberty because he is naturally in balance and equilibrium; but when he is hampered by the weight of his rider, and his impulses and desires are checked and controlled by the bit, he must receive assistance and direction from the rider to take or to keep any regularly-cadenced gait.

When the gallop degenerates into the canter, it is because the horse is not kept collected, and, in the disunited state he is in, it is necessary for him to preserve the centre of gravity by bringing one of the fore-legs to the ground before the second hind-leg is brought up to support the weight. But in the hands of a skilled rider, the centre of gravity is carried so far back that the first hind-foot can sustain the weight until the other hind-foot and a fore-foot come to the ground together, and the pace is maintained true and regular.

## BREAK FROM GALLOP TO RUN.

When the horse, either in liberty or under the saddle, takes a high rate of speed, the collected and balanced state necessary for the performance of the gallop cannot

be observed, and the disunited and irregular run is the consequence.

### THE LEAD IN THE GALLOP.

The horse, in the gallop and in the run, is said *to lead* with the fore-leg from which he goes into air. In a state of nature this would be the fore-leg upon the strongest side of the hind-quarters, for from the posterior extremity the mass is driven forward. Under the saddle, the horse may be made to take either lead, by the rider pressing the croup about to the side with which it is intended he should lead, and lightening that side of the forehand with the bit, so that the propulsive force will come from the proper side of the hind-quarters, and the required fore-leg will be induced to take the lead.

### HOW THE HORSE CHANGES THE LEAD.

The horse changes his lead in the gallop when the weight has been taken by a hind-foot and the fore-legs are in air. At this moment he advances the fore-leg that has been used to divide the weight with the posteriors, and when he goes into air from it, he changes the order of his hind-legs, and he is then true in the gallop with a new lead. It is a knowledge of this fact that permits the rider to change the lead of the gallop at will.

A proof of this may be made by any skilled horseman, in changing the lead of the fore-legs with the bit, but preventing the croup making the corresponding bend; in consequence of this application of the aids, the horse will be disconnected in his gallop, with one side leading in front, and the other side taking the extended strides behind. M. Victor Franconi, a great authority upon schooling horses, used to practise and advise this performance to render the horse obedient to hand and heels.

### THE HALT IN THE GALLOP.

The horse may be brought to a finished halt in the gallop by the rider bringing in the hind-legs of the animal with the spurs, leaning back in the saddle, and raising the bridle hand. This effects the desired object at once, for the hind-legs of the horse are carried far enough under the mass to resist the momentum, and the weights having been thrown back by the movement of the rider, and the fore-hand having been checked, the forward motion is overcome, while the opposition of the forehand prevents its renewal.

### TO MAKE THE HORSE PERFORM THE GALLOP.

To make the horse perform the gallop, his forces must be collected between bit and spurs, so that the point of

union and balance will be under the rider. The mass will then be so poised that a slight play of the *direct* rein —the right rein, if the horse be to lead with his right side—will raise the fore-hand, and induce the desired lead, while the opposite spur will bend the croup, so that the hind-quarters may take the proper stride, and stimulate the action. The bit must measure the rate of speed, and the spurs must keep up the vigour of action, while, between the two aids, the united form must be maintained.

## TO CHANGE THE LEAD IN THE GALLOP AT WILL.

If a change of lead in the gallop be desired, the rider will seize the moment when the forehand of the horse is rising, and a hind-leg has taken the weight of the mass (Plate III.), to lean back in the saddle, and make a slight play with the direct rein ; then as the horse is about to take his weight upon a fore-foot with which to leave the ground, the opposite spur should be applied to bend the croup for the new lead. The results of these applications of the aids and these changes of balance will be to give the horse a new lead in one finished stride. For the action of the body will assist the horse to the momentary pause that enables him to feel and obey the bit, the play of the direct rein will induce the change of fore-leg while

the fore-hand is in air, and when the horse takes his weight upon the fore-leg, the spur demands the change of the hind-legs while they are free to obey.

### WHEN THE HORSE IS FALSE IN HIS LEAD.

The horse is said to be *true* in his gallop on direct lines when the fore-leg and hind-leg of the same side take the longer strides. But he is *false* if he turn to the right while leading with the legs of the other side, or to the left if he be leading with the right legs.

### WHEN THE HORSE IS DISCONNECTED.

The horse is said to be *disconnected* in his gallop when he leads with one side in the forehand, and with the other side in the hind-quarters, or when one fore-leg is brought to the ground before the second hind-leg is planted (as in the canter), or when the intervals between the beats of the fore-feet and those of the hind-feet are too great, as in the run.

### THE TEST OF THE GALLOP.

The true test of the gallop, and the strongest evidence that it must differ from either the run or the canter, may be found in the *traverse*. This is a movement of the

horse to the right or to the left, upon two paths; the fore-hand following one, the croup, slightly retired, upon the other.

It can readily be seen that the traverse could not be performed in the extended state in which the horse is found in the run. Nor could it be possible in the canter, where a fore-foot reaches the ground *before* the second hind-foot. A glance at Plate II., in which the horse is represented at the canter, will show that a regularly-cadenced movement to either side would be impossible, and that the attempt in such a disunited state would be perilous.

The horse can pass to the right or to the left in a *regularly-cadenced movement* upon two paths in only the passage, the terre-à-terre (a series of leaps), and the gallop. The horse leads, in the latter pace, with the side towards which he moves. As the weight is taken upon his outside hind-leg, the fore-hand is carried in the direction of the movement, and when the leading fore-leg takes the weight, the croup is brought up.

When this movement is accomplished in the beat of the canter, or in the disconnected state of the horse in the run, it will be time to acknowledge that the three paces are identical.

I have not thought it incumbent upon me to treat of

the so-called gallops in place and to the rear, or the step-by-step changes, as they are school movements, difficult to teach and to ride, and in each there are variations from the true gallop. But I may say that in the first the fore-hand rises from the ground, and the hind-leg which would have been leading in advancing is momentarily detached from its place, then, as the mass sinks, the raised hind-leg is planted and the fore-feet follow to the ground. In the gallop to the rear, the hind-leg which has been raised in the preceding action is moved backwards, while the weight is taken by the other hind-leg, which in turn is moved to the rear, and the fore-hand then comes to the ground. In the step-by-step changes the mass is held poised, by the aid of the bit, upon the two hind-legs while the fore-legs change the lead, and as the weight is taken by the fore-hand the order of the hind-legs is changed. As the legs follow in their proper order the effect to the eye is a change in air. There is thus a momentary *halt* in that step in which in the run the horse covers the most ground—that is, in the step between a hind-foot and a fore-foot.

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